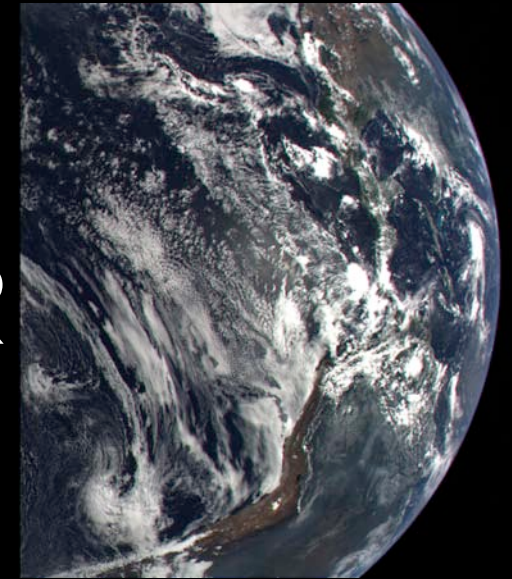


# Discovery Program Lessons Learned:

## MESSENGER



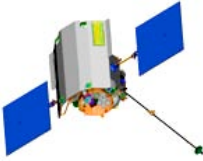
2 August 2005  
MDIS wide-angle image of Earth

Principal Investigator  
Sean C. Solomon  
Department of Terrestrial Magnetism  
Carnegie Institution of Washington

Lessons Learned Workshop for PI-Led Planetary Science Missions  
Crystal City, VA  
11 April 2006

3 August 2004  
2:15:56 EDT





# MESSENGER

## Some Obvious Lessons for PIs

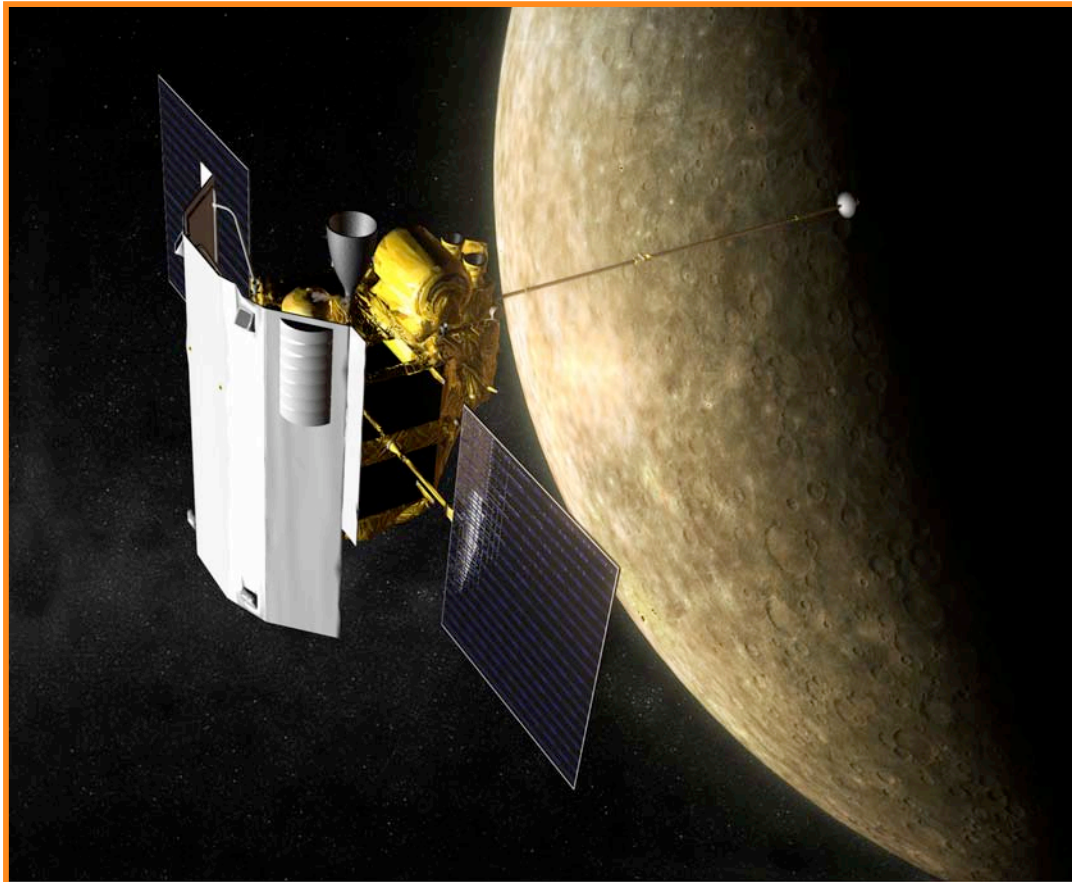


- Budget ample reserves: cost, schedule, mass, power
- Learn project management and systems engineering
- Assemble the best possible team
- Accomplish as much in Phase B as possible



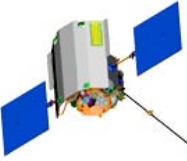
# MESSENGER

Faced Broad Challenges



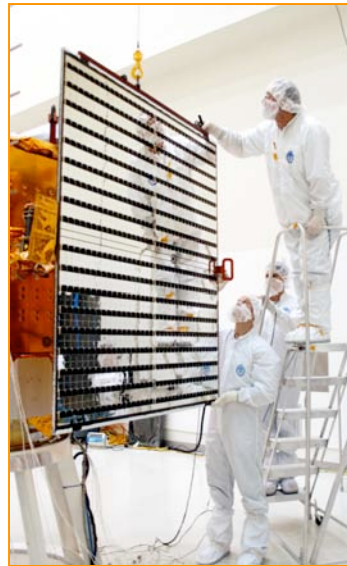
- Demanding limits to mass growth
- Hazardous thermal environment
- Complex mission design with limited launch opportunities and a long cruise phase





# MESSENGER

## Anticipate Technical Challenges



MESSENGER Solar Array



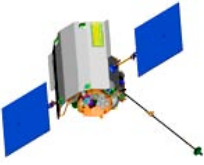
MESSENGER IMU

### **A challenge anticipated: Solar arrays**

- Multiple vendors engaged
- Thorough testing program
- Final vendor selection after all prototype testing

### **A challenge not anticipated: Inertial Measurement Unit (IMU)**

- Expertise resided with a single vendor
- That vendor was bought out by a new vendor, who closed a key facility and had to reinvent expertise



# MESSENGER

## Anticipate Management Challenges



Max Peterson  
MESSENGER PM  
1998 - January 2003



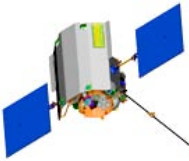
Richard Huebschman  
MESSENGER DPM  
June 2001 - October 2002



Dave Grant  
MESSENGER PM  
February 2003 - present

### During Phases B and C/D:

- MESSENGER had two Project Managers and two Deputy Project Managers
- The NASA Solar System Exploration Division had four Directors
- The Discovery Program had three Program Managers and added the position of Program Director in 2004
- There were five successive Discovery Program management organizations



# MESSENGER

“We’re from the Government and ...”



- Plan for NASA’s tolerance for risk to change between your selection and launch
- Plan for more reviews than were initially specified
  - View them as learning opportunities
  - Learn to assess their cost and negotiate accordingly
- Learn about ITAR and its impact on team member access, hardware acquisition, and publication approval procedures

This is not the correct ITAR